



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/618,328	07/11/2003	Neal G. Skinner	2000-IP-000991 U1 USA	4751
20558	7590	10/13/2004	EXAMINER	
KONNEKER & SMITH P. C. 660 NORTH CENTRAL EXPRESSWAY SUITE 230 PLANO, TX 75074				FITZGERALD, JOHN P
		ART UNIT		PAPER NUMBER
		2856		

DATE MAILED: 10/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/618,328	NEAL SKINNER	
	<b>Examiner</b>	Art Unit	
	John P Fitzgerald	2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on \_\_\_\_.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-105 is/are pending in the application.
- 4a) Of the above claim(s) 6,14-26,55-85,93 and 95-99 is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_ is/are allowed.
- 6) Claim(s) 1-5,7-12,27-38,41,86-92,94 and 100-105 is/are rejected.
- 7) Claim(s) 13,39,40 and 42-54 is/are objected to.
- 8) Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 11 July 2003 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____ .   |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>7-11-03</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|  | 6) <input type="checkbox"/> Other: ____ .                                   |

**DETAILED ACTION**

***Election/Restrictions***

1. This application contains claims directed to the following patentably distinct species of the claimed invention: Figure 2; Figure 4 and 5; Figure 6.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, claims 1, 38, 86 and 100 are generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. § 103(a) of the other invention.

2. During a telephone conversation with Mr. Marlin Smith on 29 September 2004 a provisional election was made with traverse to prosecute the invention of Figure 2, claims 1-5, 7-13, 27-37, 38-54, 86-92, 94 and 100-105. Affirmation of this election must be made by applicant in replying to this Office action. Claims 6, 14-26, 55-85, 93 and 95-99 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

***Claim Rejections - 35 USC § 102***

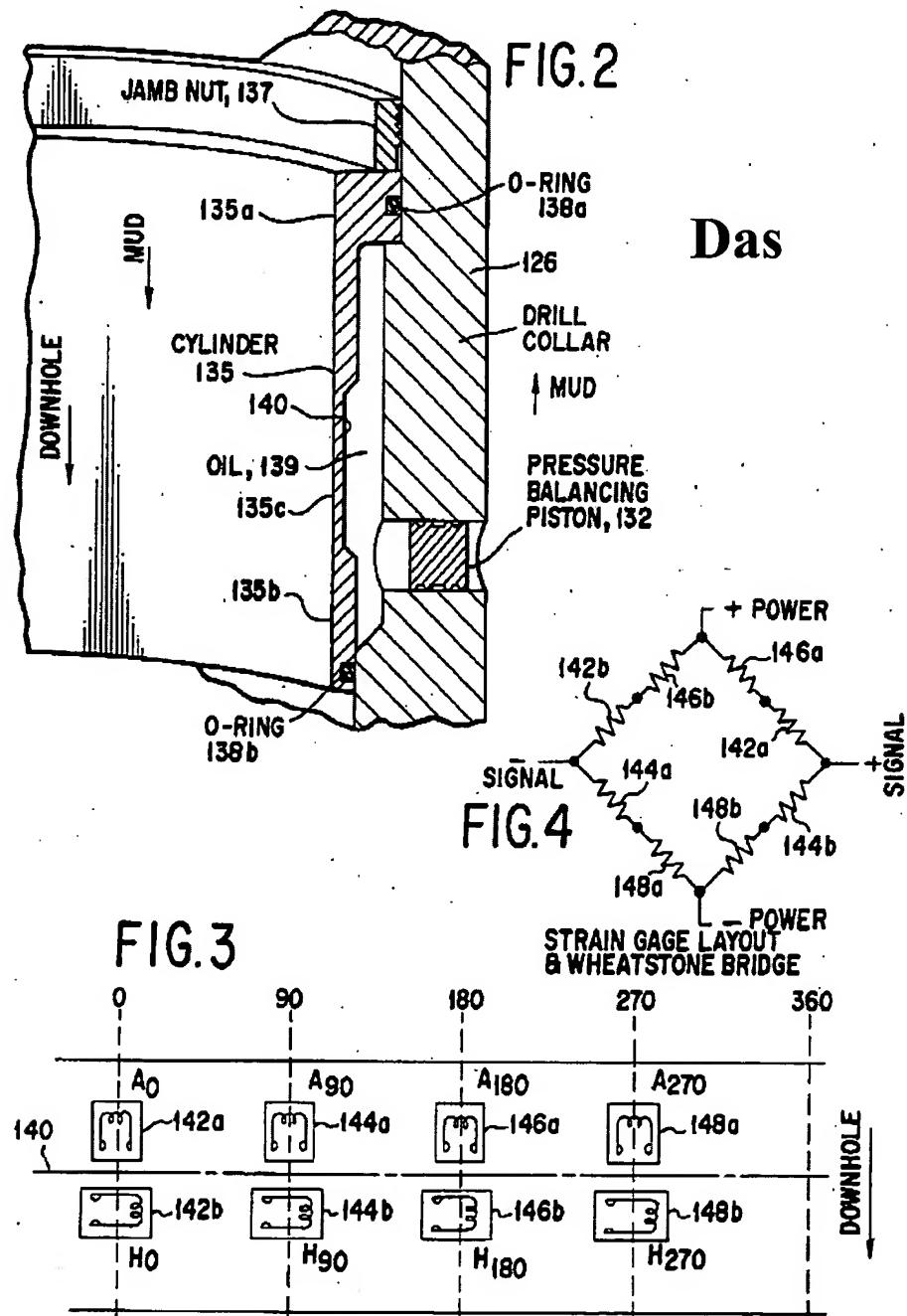
1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-5 and 7-12 are rejected under 35 U.S.C. § 102(b) as being anticipated by US 4,805,449 to Das. Das discloses a subterranean well system (Figs. 1-3) having a structure in which strain is induced in response to a pressure differential in the well (Das: col. 1, lines 6-12); and first (142a) and second strain (148b) sensors attached to the structure at approximately the same longitudinal positions (Fig. 3) radially offset with respect to each other by approximately 180° on a hollow cylinder (135), the first strain sensor measuring axial strain (first direction) and the second measuring hoop strain (second direction) (note orientation of strain gauges in Fig. 3) (Das: col. 3, lines 4-12) (as recited in claims 7 and 8); the strain sensors measuring strain induced by both the pressure differential and temperature (Das: col. 7, lines 23-28) (as recited in claims 3-5 and 9-11); wherein a predetermined mathematical relationship exists between the pressure

differential and the first and second measured strains (see Table at top of col. 7) (as recited in claims 2 and 11) and wherein the pressure differential exists between an interior of the cylinder and an exterior of the cylinder (see Fig. 2).



3. Claims 38 and 41 are rejected under 35 U.S.C. § 102(b) as being anticipated by US 5,024,098 to Petitjean et al. Petitjean et al. disclose a subterranean well sensor system (Figs. 1-3) having a generally tubular structure (10a, 10b) (Fig. 3) having a pressure differential applied across its inner and outer surfaces, the pressure differential existing between well pressure applied to one of the inner and outer surfaces and a second predetermined pressure (0.1 Pa within an annular space (12)) between the structure and an outer housing (as recited in claim 41); first and second strain sensors (32) detecting strain induced by the pressure differential and temperature change in the well, the first and second strain sensors measuring strain in the structure in first and second directions different from one another (note orientation of the four strain sensors (32) in Fig. 2) (as recited in claim 38).

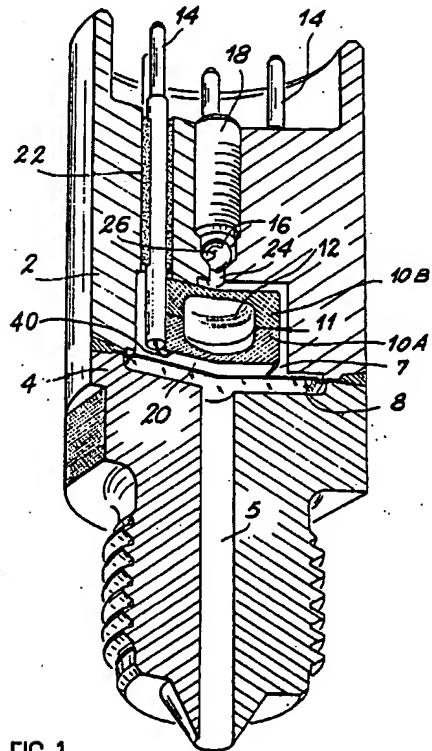


FIG. 1

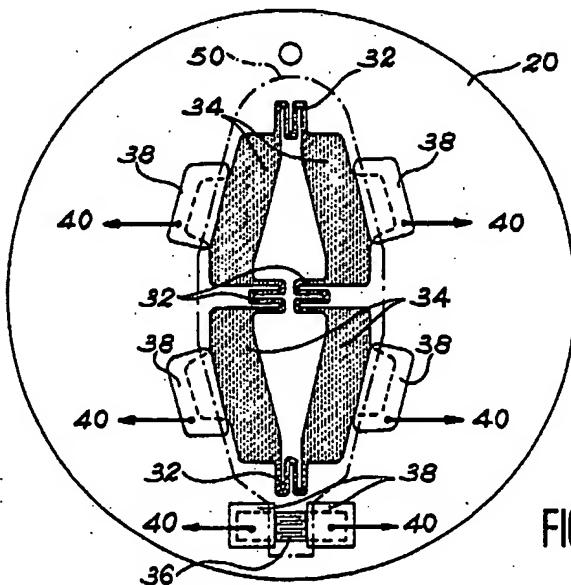
**Petitjean et al.**

FIG. 2

4. Claims 86-92 are rejected under 35 U.S.C. § 102(b) as being anticipated by US 4,805,449 to Das. Das discloses a method of measuring pressure in a subterranean well (Figs. 1-3) the method steps including: applying a pressure differential and a temperature change across a structure positioned in the well (see Fig. 2); detecting a first strain in the structure in a first direction using a first strain sensor (142a); detecting a second strain different from the first strain in the structure in a second direction using a second strain sensor (148b) due to the pressure differential and temperature changes across the structure (note orientation of strain gauges in Fig. 3); calculating the pressure differential using a predetermined mathematical relationship between the pressure differential and the first and second strains (see Table at top of col. 7); wherein the strains due to temperature changes are subtracted (compensated) from the strains measured due to the pressure differential via a Wheatstone bridge (Das: col. 7, lines 23-28) (as recited in claim 89); wherein first and second directions are orthogonal to one another (i.e. axial and hoop directions) (see Fig. 3) (as recited in claims 90 and 92); wherein the structure includes a generally tubular portion (135) and the pressure differential is applied between the inner and outer surfaces of the tubular portions (see Fig. 2).

5. Claims 100-105 are rejected under 35 U.S.C. § 102(b) as being anticipated by US 4,805,449 to Das. Das discloses a method of measuring pressure in a subterranean well (Figs. 1-3) the method steps including: applying a pressure differential and a temperature change across a structure having a generally tubular portion, positioned in the well (see Fig. 2); detecting a first strain and a second strain in the structure induced by the pressure differential and temperature change via first (142a) and second (148b) strain sensors and a predetermined mathematical relationship existing between the pressure differential and the first and second strains (see Table

at top of col. 7) (as recited in claims 100-103); wherein the first and second strain sensors are centered at approximately a same longitudinal position on the tubular portion, and the first and second sensors are radially offset with respect to each other by approximately 180° (see Fig. 3) (as recited in claim 104); wherein the first and second strain detecting steps sense hoop and axial strain, respectively in the tubular portion of the structure (as recited in claim 105) (note: orientation of strain gauges in Fig. 3).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 27-37, 44-54 and 94 are rejected under 35 U.S.C. § 103(a) as being unpatentable over US 4,805,449 to Das and US 5,024,098 to Petitjean et al. as applied to claims 1, 38 and 86 above, and further in view of XP-002053711 to Kersey. Das and Petitjean et al. disclose a subterranean well sensor system and method of measuring pressure in a subterranean well having all of the elements stated previously. Neither Das or Petitjean et al. disclose the use of fiber optic sensors and their many variants as recited in the dependent claims. Kersey teaches the employment of fiber optic sensors for measuring temperature and strain (thus stress/pressure) in subterranean wells utilizing Bragg gratings, Mach-Zehnder interferometer, Fabry-Perot interferometer and others. It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ any type of fiber optic sensor, as taught by Kersey, modifying subterranean systems disclosed by Das and Petitjean et al., thus providing high-

sensitivity strain measurements (Kersey: pages 310-314). Furthermore, it would have been an obvious matter of design choice to employ any one of the fiber optic sensors recited in the claims, since applicant has not disclosed that any particular type of fiber optic sensor solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with any type of fiber optic sensor.

***Allowable Subject Matter***

8. Claims 13, 39, 40 and 42-54 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Demia, Sweetland et al., Clark et al., Kirsch, Bouldin et al., Kempf, Kovari et al., Claycomb, Nisle and Botto et al. all disclose various aspects of the instant invention.

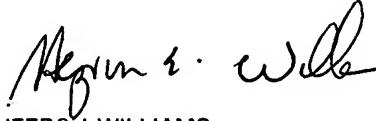
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Fitzgerald whose telephone number is (571) 272-2843. The examiner can normally be reached on Monday-Friday from 7:00 AM to 3:30 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams, can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system.

Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



JF

09/30/2004

  
HEZRON WILLIAMS  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800